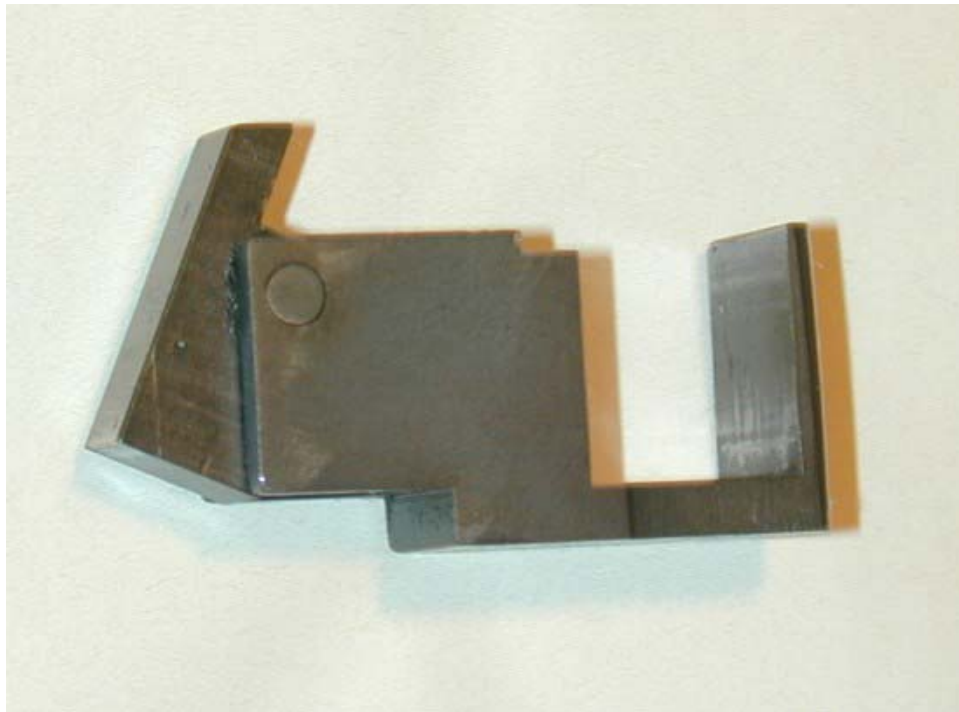


The Drop in Auto Sear Conversion for the AR-15

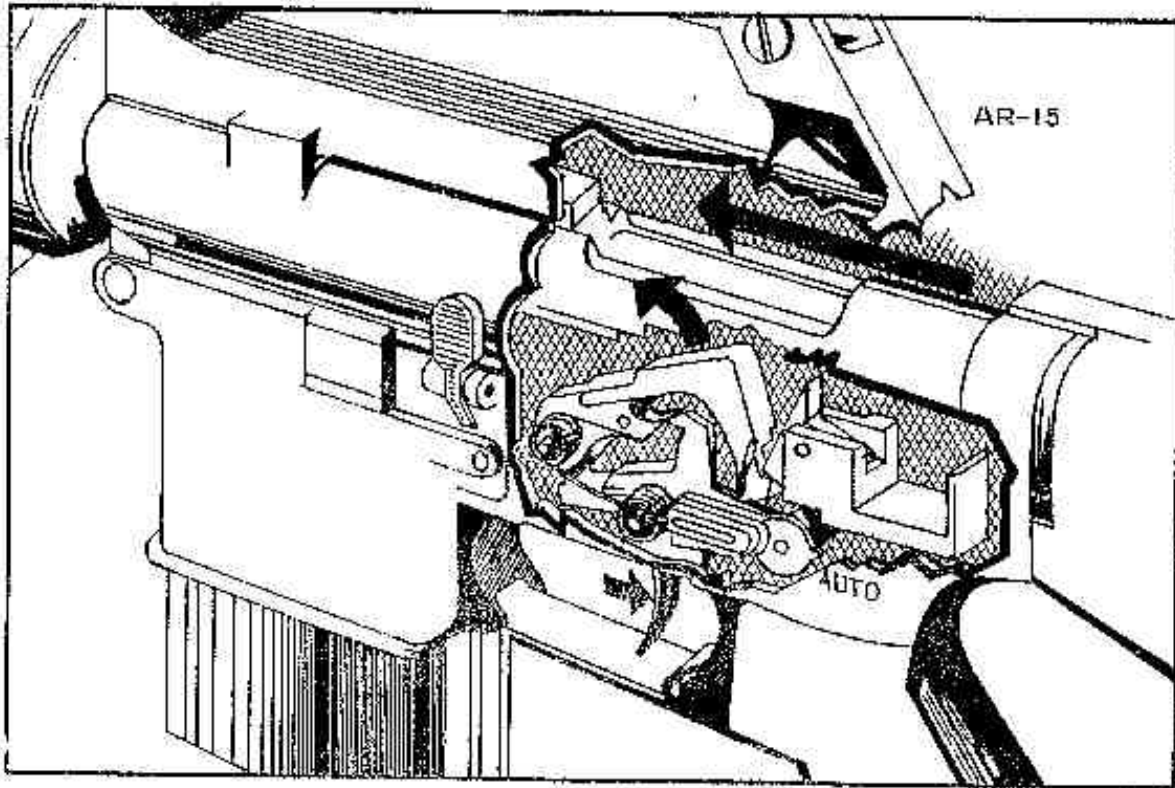
Written by www.Quarterbore.com

The Drop In Auto Sear (DIAS) is a device that adds an auto sear to an otherwise semi-automatic AR-15 so that when used with M-16 fire control parts including an M-16 carrier produces full auto fire. The DIAS is referred to as a "Drop In" as this piece can be added to an AR-15 without drilling a receiver for a traditional auto sear. Following is a photo of a registered Drop In Auto Sear (rDIAS) made by JCB and registered before 1986.



How The DIAS Works:

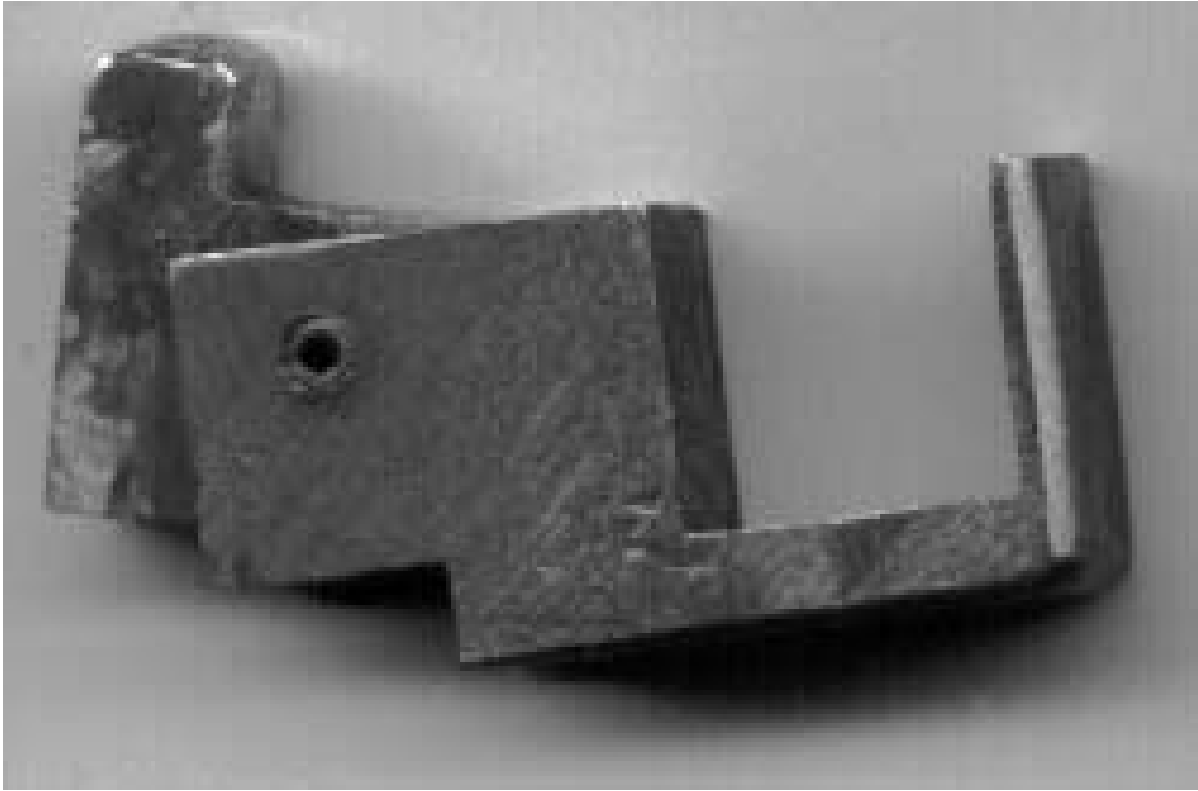
When shooting an AR-15 with a DIAS installed, the first shot causes the hammer to be cocked by the M-16 carrier as it is sent rearward from the gas from firing. As the carrier shoves the hammer down, the sear of the DIAS catches the hammer where it is held while the M-16 carrier continues traveling to the rear. When the carrier finishes its rearward movement and closes due to the force of the buffer spring, the M-16 bolt carrier then catches the top of the sear in the DIAS assembly that releases the hammer. The M-16 carrier is specifically manufactured so that the lower surface of the carrier trips the sear in a specific location to ensure that the hammer is released at the correct time. This operation occurs in a DIAS every time an AR-15 is fired with a DIAS installed. Following is a drawing that shows the DIAS installed.



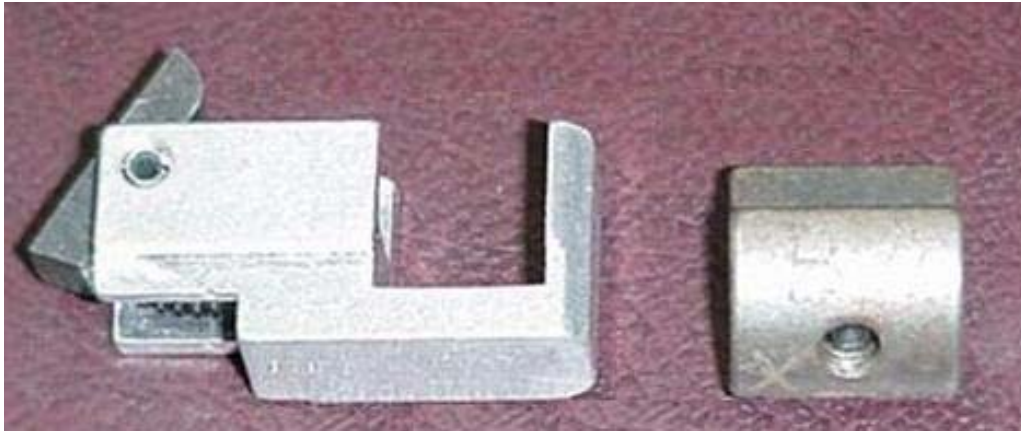
AR-15 WITH DROP-IN AUTO-SEAR

Selective fire with a DIAS is obtained due to the M-16 disconnector and selector. When an AR-15 with a DIAS is fired as described above and the selector is placed in the semi-automatic position, the hammer is caught by the disconnector after the M-16 bolt carrier releases it. The disconnector operates in this role in an identical to the way in a semi-auto AR-15. When the selector is switched to "AUTO", the selector presses down on the disconnector so that the disconnector hook is no longer able to catch the hammer when the M-16 carrier releases the hammer. As a result, in the "AUTO" position, the hammer is retained in a cocked position until the carrier comes forward and slams the sear, which releases the hammer. The hammer then travels forward until it hits the firing pin and the cycle repeats until the trigger is released.

JCB Registered Drop In Auto Sear (DIAS)

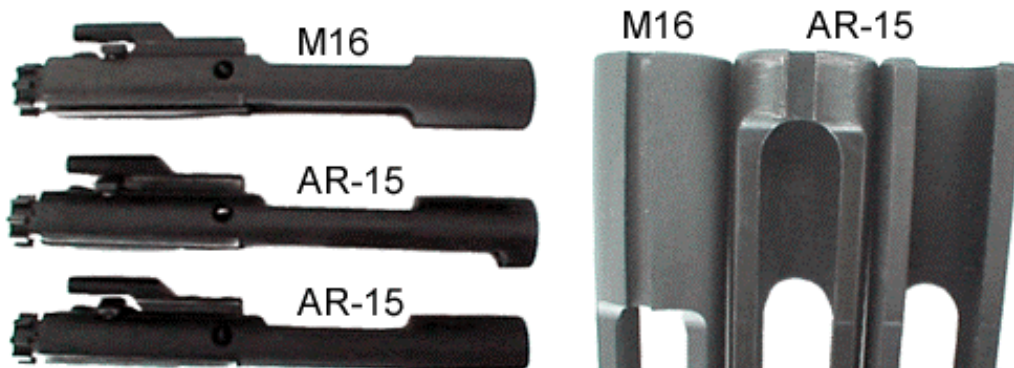


The DIAS and Bolt Carriers:



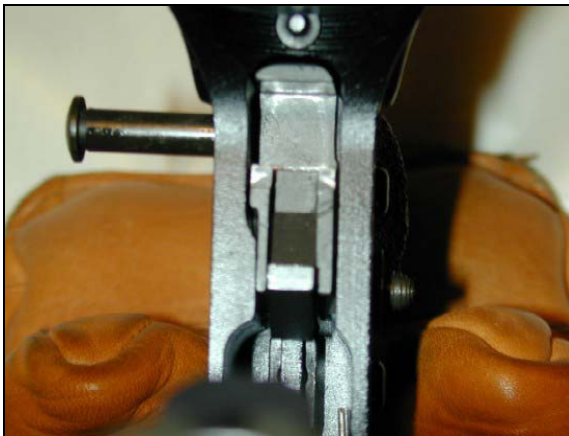
On the left of the above photo is the rDIAS while the block on the right is used to extend the bottom sear engagement cut on an SP-1 style carrier (see photo below) back to the original M-16 bottom sear engagement cut dimensions. This is shown here as the DIAS will work with the M-16 Carrier or a SP-1 carrier that has this extension block added.

Bolt Carrier



I should note that Colt changed the SP-1 carrier (AR-15 Carrier on right above) by milling out the bottom of the carrier all the way to the rear of the carrier. Colt did this modification to prevent illegal conversions of their AR-15s by individuals creating Lightning Links or DIAS with the extension block as shown above.

Placing a DIAS into a lower receiver.



The photograph of the DIASs above provide a demonstration of how the DIAS body is used to place the sear into the proper location so that the sear can catch the M-16 hammer during fire. The placement of a DIAS is critical as it is this placement which determines the location of the sear trip. The trip must be in the correct location to ensure that the M-16 hammer is captured and that the m16 hammer is released at the correct time so that the bolt is closed allowing the weapon

to fire in full automatic mode! The specific placement of the DIAS is referred to as timing and it is the timing the DIAS.

Timing a DIAS:

The DIAS has some play in the rifle receiver to allow the device to be shimmed or timed to a specific rifle. The proper timing of the sear is when the sear releases the hammer when there is a gap between the carrier and the barrel extension face of .083. Inserting a wire gauge of the correct thickness into the front of the ejection port against the barrel extension face and closing the bolt with only the sear retaining the hammer verifies the correct release-timing gap.

Depending on the fit of the DIAS to the rifle, the sear can be shimmed up or back to advance the timing/gap of the release. If the timing needs to be retarded for the correct release gap, then the sear can be shimmed down or forward. As a note, if the sear is to be used in more than one rifle, it is best to apply the shims to the rifle itself, than to apply the shims to the sear, which would limit the sear timing to a specific rifle.

Procedure to time a DIAS

The DIAS must be timed with each change of upper or lower. To check the timing is easy, to adjust the timing is hard. With a M16 or AR15 with M16 parts and the DIAS in place...

1. Remove any magazine and ammo from the gun.
2. Set the selector on the full auto position.
3. Drop the hammer with the trigger (you did check to see the chamber was empty right?)
4. Now you need your timing gages (The cheapest is drill shanks at the required dimensions. I use three, one early timing gage .12 dia, one correctly timed gage .10 dia, and one late timed gage .08 dia.)
5. Secure the trigger in the fired condition (rearward) with wire. Using the charging handle pull the bolt carrier all the way to the rear but do not let it go, slowly lower the carrier towards the front until you have a 1/2" gap left between the carrier and barrel extension.
6. Insert the early timed gage in between the bolt carrier and the barrel extension (not the bolt head) and slowly lower the bolt carrier with the charging handle. If the auto sear releases then your gun is out of time (early) and will most likely give you light primer hits. If not go to step 7.
7. Slightly retract the charging handle and remove the early gage and insert the late gage. Slowly lower the carrier until the carrier rests on the gage that is between the bolt carrier and the barrel extension. The hammer should have dropped, if it did not the gun is out of time (late) and will most likely either not release the hammer or act sluggish and have a slow cyclic rate. If it dropped go to step 8.
8. Pull back on the charging handle and recock the gun while removing the late gage. slowly lower the bolt carrier with the "go" or correctly timed gage until the bolt carrier rests on the gage that is against the barrel extension. The hammer might release or might not.

This same system could be used to check the timing of a M-16 or RR AR-15 using a traditional auto sear as well. The key is to set the timing so the hammer falls with the 0.10 diameter gage but not the early gage. Assuming that the hammer was released on this gage but not the early gage the gun is timed.

Now that you have determined the timing of the gun you must adjust it. the DIAS should NOT be loose in the gun since it can shift and effect your timing. The easiest way to secure it in the gun is to A) drill a hole and tap it in the auto sear body so you can clamp it to the upper lug and adjust the timing with shims on the front side or 2) You can glue plastic shims to the upper lug with JB weld so the DIAS is timed to each upper by the shims on that lug. Moving the sear forward in the gun makes the timing later (therefore correcting an early timed sear) and rearward makes the timing earlier (correcting a late timed sear).

AR15 DROP-IN AUTO SEARS - WHAT'S THE DIFFERENCE?

Originally by Jeff SelectFire@aol.com with updates by Quarterbore

There are two types of AR15 Drop-In Auto-Sears (DIAS) available; (1) the so called "legal pre-81" auto sears and (2) the registered auto sear. The "pre-81" sears are commonly advertised in Shotgun News for about \$125-\$200. The registered and transferable ones are much more difficult to find, and currently (Nov-2003) are priced in the \$7500 - \$8500 price range. The purpose and function of each type is the same; to convert a semi-automatic AR15 rifle to full automatic. While there is no physical difference between the two, there are enormous legal differences - one is completely legal to own and use, the other is a felony waiting to happen.

THE REGISTERED & TRANSFERABLE DROP-IN AUTO SEAR

This is a an auto sear made before 1986 and registered (tax paid) with the BATF as a machinegun. Currently (Nov-2003) they sell in the \$7500 - \$8500 price range and require an additional \$200 transfer tax to own. This is the only type an individual can use to make an AR15 full auto. To obtain one, an individual (non FFL/SOT) would have to live in a state that permits ownership of full auto firearms and complete a BATF form 4 in duplicate with fingerprints, pictures, and a CLEO certification. The auto sear itself is legally the same as a complete transferable machinegun - it is legal to own and use, provided the paperwork is filed with BATF and you receive an approved form 4. The registered auto sear requires installation of M16 (full auto) fire control parts (trigger, disconnect, selector, hammer, and bolt carrier) in the semi automatic host rifle. Normally, even possession of an M16 part with an AR15 is a felony - it doesn't even have to be installed in the gun! If you own a registered DIAS however, possession is permitted as long as you are the legal owner of a registered DIAS. If the DIAS is removed from the rifle, the M16 parts MUST BE REMOVED also. The instant a registered DIAS is removed, any M16 parts in the AR15 will constitute a felony. The same principle also applies to barrel length. If you have a short barrel (less than 16") on an AR15 with a registered DIAS installed, you must remove the barrel/upper whenever the DIAS is not in the gun. The registered DIAS can be installed in either a pre or post ban AR15 with all the evil assault features you wish. Because the DIAS makes the rifle full automatic when installed, it is no longer covered by the 1994 assault weapons ban, which defines an assault weapon as a "semiautomatic rifle" with specific features (bayo. lug, threaded barrel, flash hider, etc.). When the sear is removed from a post-ban gun, you must restore the gun to a post-ban configuration, and remove those evil assault features. Just remember, when the registered DIAS is installed, the host gun becomes like a machinegun and is treated as such. The instant the DIAS is removed, the host firearm must revert back to its original semiautomatic state (no F/A parts, no short barrels), and if a post ban, it must comply with the assault weapons ban.

THE "PRE-81" DROP-IN AUTO SEAR

The "pre-81" DIAS - commonly advertised in Shotgun News for about \$125-\$200 are a completely different item than a registered DIAS. Prior to 1981 it was legal to make and own these sears without necessarily registering them as machineguns. BATF eventually caught on, and in 1981 issued a ruling that the sears were considered machinegun conversion parts and sears made after 1981 had to be registered (tax paid) and transfer as any other NFA item (these became the registered ones referred to above). BATF grandfathered the unregistered sears made prior to 1981, but sears made after 1981 had to either be registered or are considered unregistered machineguns - a serious felony. IT IS A FELONY TO POSSESS BOTH A PRE-81 DROP-IN AUTO SEAR AND AN AR15 - UNDER NO CIRCUMSTANCES CAN AN INDIVIDUAL LEGALLY USE A PRE-81 DIAS IN AN AR15. Technically, you are allowed to possess an unregistered DIAS which was made prior to 1981, but you cannot possess one if you own an AR15 - it's one or the other, but not both. Obviously, this rule makes possession of a pre-81 DIAS useless - if you cannot own the rifle it goes in, about all you can do with them is to make cufflinks, earrings, or a very small paperweight.

The so called "pre-81" DIAS presents another legal problem, which can make the mere possession of the sear a felony - even in the complete absence of an AR15. As stated previously, only sears made prior to 1981 are allowed to be unregistered - any sears made after the 1981 ruling must be registered or will be considered by BATF to be unregistered machineguns. Because none of the pre-81 sears carry a serial number which can be definitively linked to a date of manufacture, there is no way to prove to BATF or a prosecutor that an unregistered pre-81 DIAS was actually made prior to 1981. If you are caught with one (just a sear, not even with a rifle) BATF can assume it was made after 1981, and therefore prosecute for felony possession of an unregistered machinegun. The burden of proof will fall on the owner of the sear to prove it was made prior to 1981 - very difficult to do without a serial number or date of manufacture on the sear itself. Granted, some pre-81 sears come with a letter purported to document the sears authenticity, but often these are just Xeroxed, and will not stand up to the scrutiny of a prosecutor.

CONCLUSIONS

If you are considering buying an auto sear to convert your AR15 to a full automatic firearm, there is only one option - the registered & transferable DIAS. While it may be tempting to buy a pre-81 to save thousands over the registered sear, the risks are considerable. Possession of an unregistered machinegun (a pre-81 DIAS and an AR15 rifle...or possibly even just a so called "pre-81" DIAS) is a felony punishable by up to 10 years in prison, and up to a \$250,000 fine, and permanent loss of your right to ever own a gun or vote again. Numerous rumors have circulated that some of the people selling the pre-81 sears

are actually BATF operations. Buyer beware.

Note: The above is a good general overview of the difference between a transferable and pre-81 DIAS. Please note that recent court cases have said that it is illegal to transfer a pre-91 DIAS so even if an individual could find a Pre-DIAS you can not be given it or buy it as such a transfer is the transfer of a machinegun punishable by 10-years in jail and \$250,000 in fines!

The "Married Receiver" DIAS conversion:



The photograph of a DIAS in the lower above shows a different style of DIAS and shows the M-16 Fire Control Group (FCG) installed. It is noteworthy that the rifle in the photo above is actually a Registered Receiver (RR) that was originally a semi-automatic Colt SP-1 that someone had registered as a Machine Gun on an ATF Form 1 prior to 1986.

In this case, when the individual received their approved Form 1 they decided to convert the receiver to full auto by adding this DIAS as opposed to milling and drilling the lower and adding the more traditional GI Auto Sear that most people used to create a Registered Receivers. This combination is commonly referred to as a Married DIAS-Receiver and the serial number that will be on the ATF forms will be the serial number from the lower receiver and not a serial number stamped on the DIAS.

Drawings with Drop In Auto Sear Specifications

LEGAL NOTE: The following provides the specification and information that could be used to make a functional DIAS. This information is provided for "EDUCATIONAL USE ONLY" or for use by those that have the appropriate legal licenses or those that live in countries where they can build these legally. It is illegal for anybody in the United States to manufacture a DIAS regardless of whether or not you own an AR-15, M-16 or any other weapon. A DIAS is classified as a Machine Gun ALL BY ITSELF and you can go for jail for building or owning one even if you do not have ANY GUNS!

The material that follows is intended so that a viewer can see how these are built and appreciate the system... NOT TO BUILD AN ILLEGAL devise. I assume no responsibility if anybody makes something from the following information and hurts himself or herself, destroys a weapon, or gets arrested and/or fined. You have been warned!

The Conversion Manual for the AR-15 includes information on how someone would make a true M-16 Conversion from an AR-15, the DIAS, as well as the Lightning Link. You will note that the information in the PDF File is the same as the information presented above. Note that all of these conversion methods are illegal to perform are supplied **for educational use only!**

See Following Pages!

PARTS IS PARTS

The four parts of the drop-in auto-sear are a pretty straight-forward proposition.

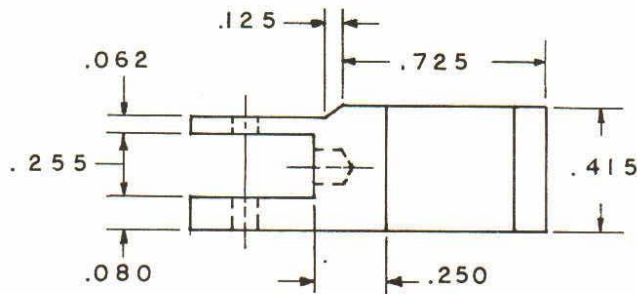
The sear housing can be made from either mild steel or aluminum. The housing bears very little stress, so a hardened housing is not needed.

The sear trip is another story. This is the part of the drop-in sear that takes the beating. It not only catches the hammer in a cocked position, it also is struck with the full force of the bolt carrier each time the weapon cycles. Firing at a rate of 750 rounds a minute, it takes a real beating.

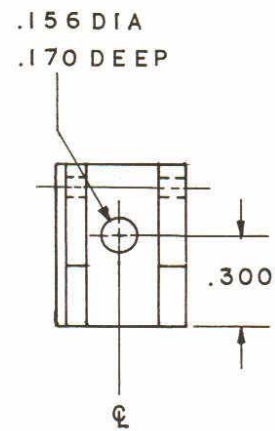
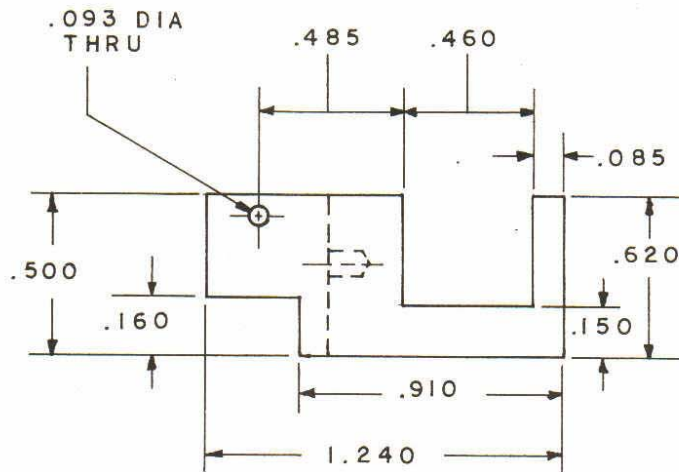
Manufacture the trip from high carbon oil quenching steel.

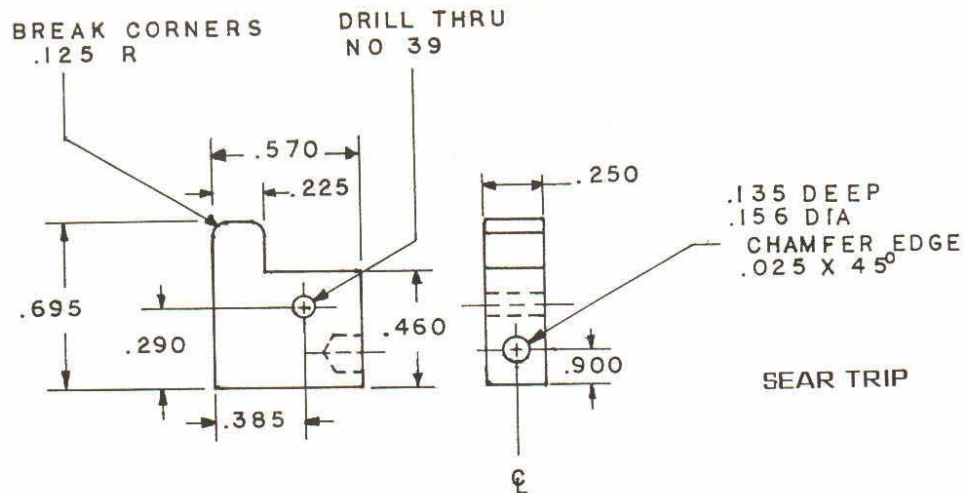
It can be hardened by heating it a bright cherry red with a torch and dropping it immediately into 10 wt. motor oil. This is best done outside because of smoke from the oil.

To temper the part after hardening, place it in your kitchen oven for one hour at 500 degrees. Let it cool with the oven door closed. WARNING.....DO NOT USE A MICROWAVE!



SEAR HOUSING





The spring is made from No. 18 wire. Wind it around a mandrel that has been turned on a lathe. You will have a spring exactly like the one shown in the drawing.

OR

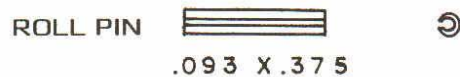
Find a hunk of spring that fits in the hole at the front of the sear body without dragging, chop it off at the right length, and call it a job well done.



10 TURNS NO. 18 MUSIC WIRE
RATE: 8 lbs/in

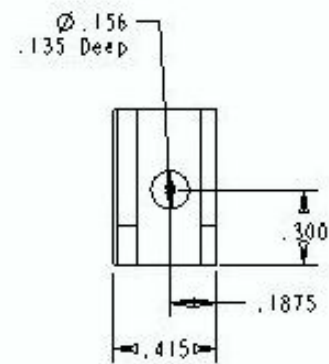
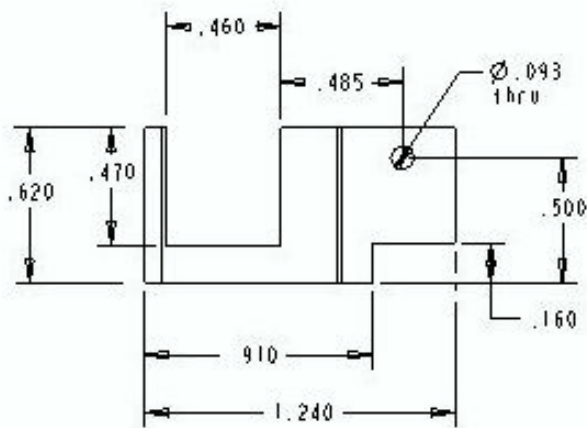
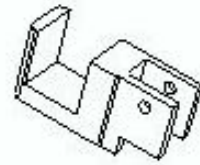
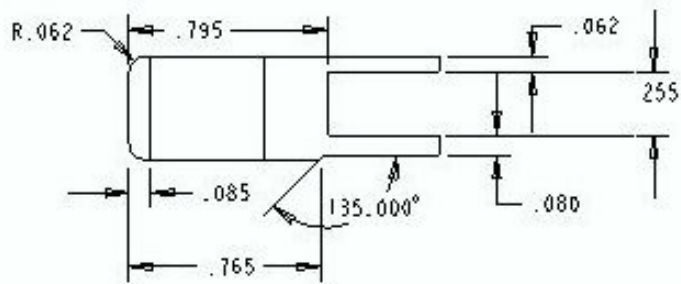
The trip pin can be made from drill rod stock. Although I find a roll pin works as well without the need for a precision fit in the sear housing.

Whichever is used, make sure the trip rocks freely on the pin when it's assembled.

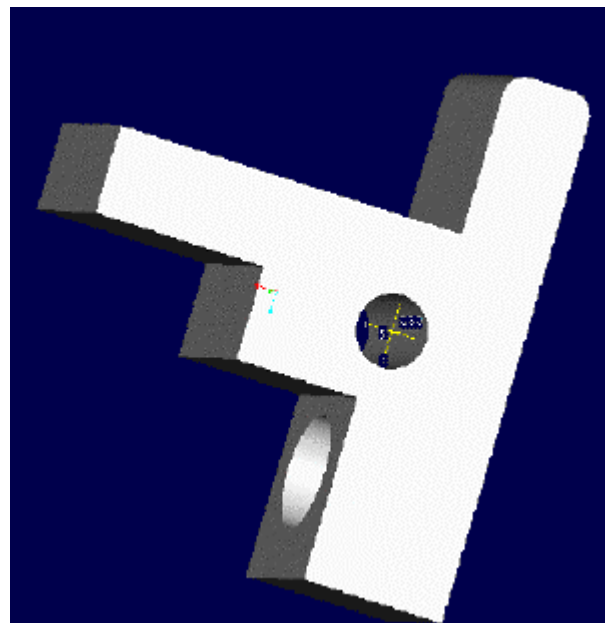
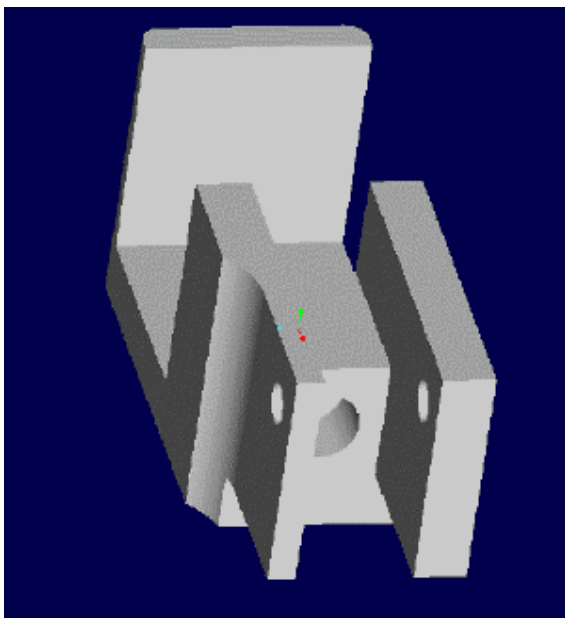


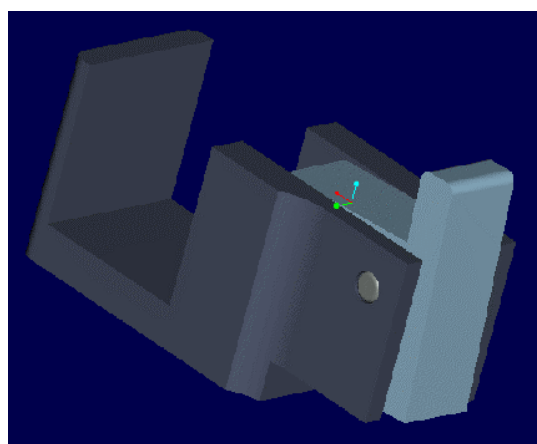
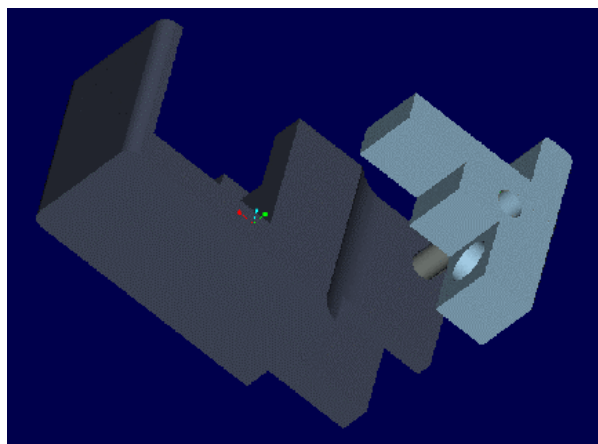
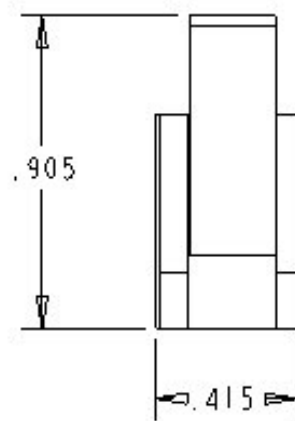
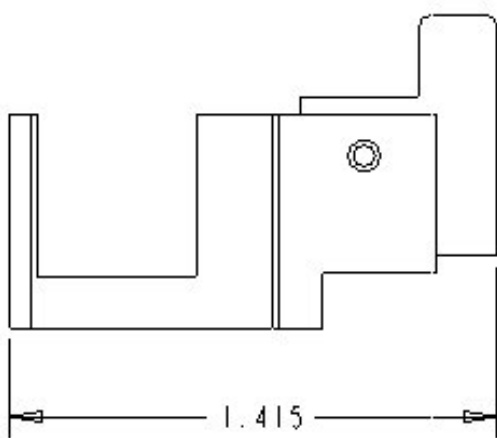
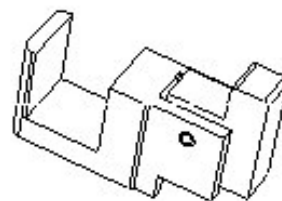
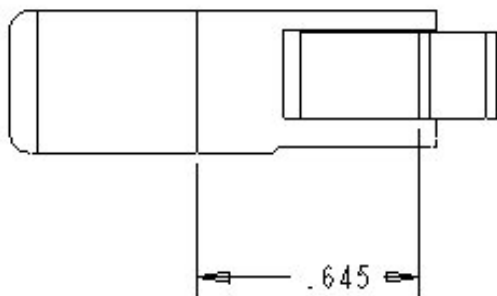
TEST FIRE

Test fire as outlined at the end of CHAPTER ONE.

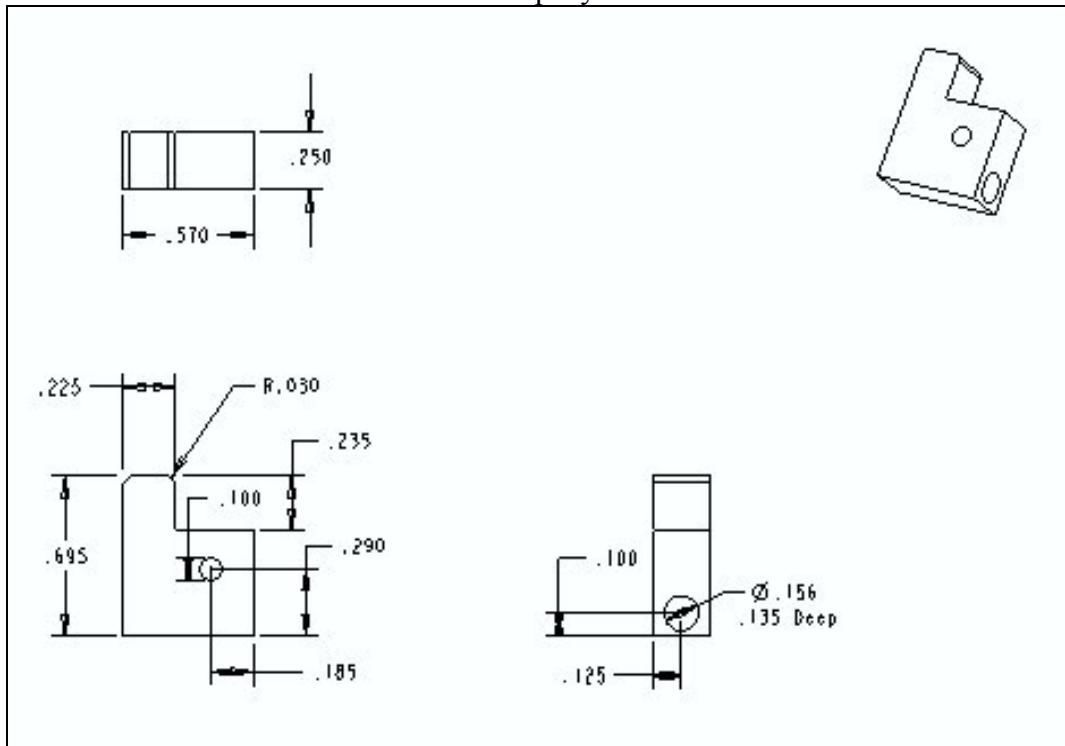


SCALE 2.000

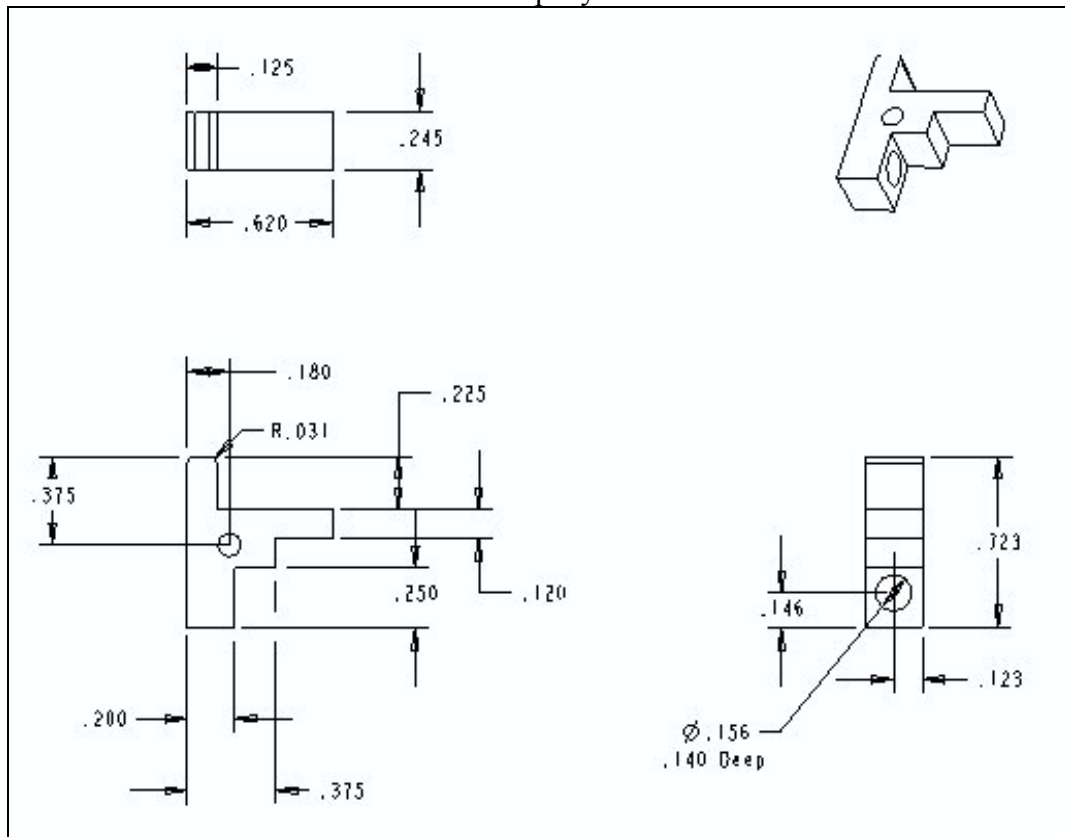




DIAS Trip style #1:



DIAS Trip style #2:



Additional Technical Specs in PDF format

[DIAS Housing](#)

[DIAS Sear](#)

[DIAS Assembled](#)

Also See:

[AR15 to M16 Conversion Manual:](#)

[Return to main Index](#)